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(54) Portable vacuum device for skin treatment

(57) The device comprises a double-action suction pump housed in a container 2, a handle 18 with suction head 19 for skin treatment, and a flexible connecting tube 17 between the pump and the handle. The container may act as a housing for the tube and handle and may hold additional heads.

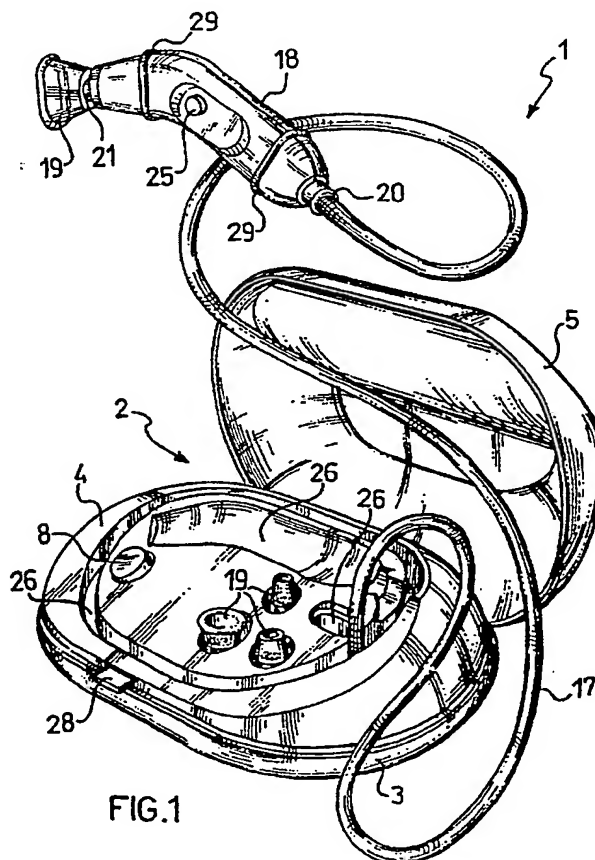
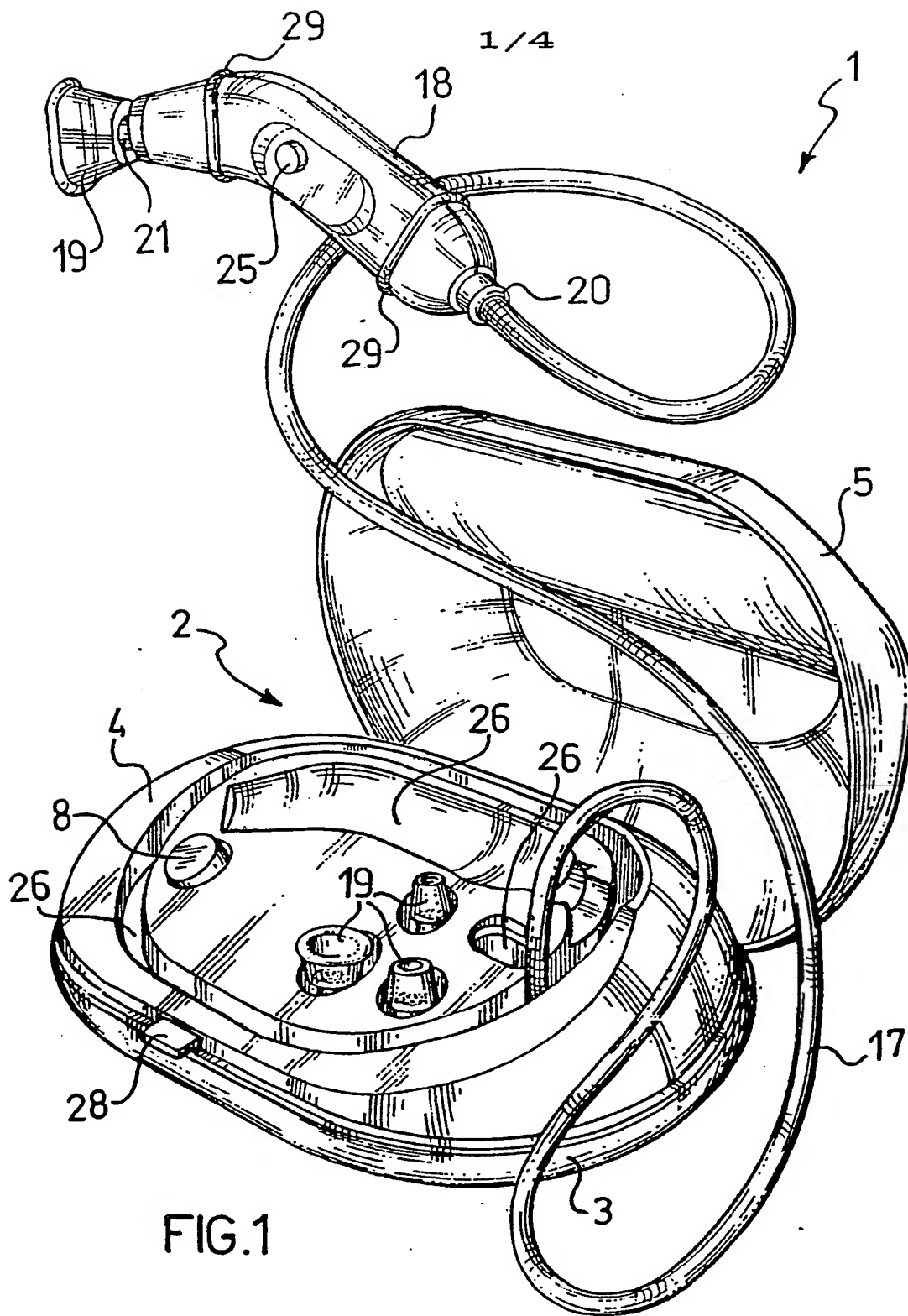


FIG.1

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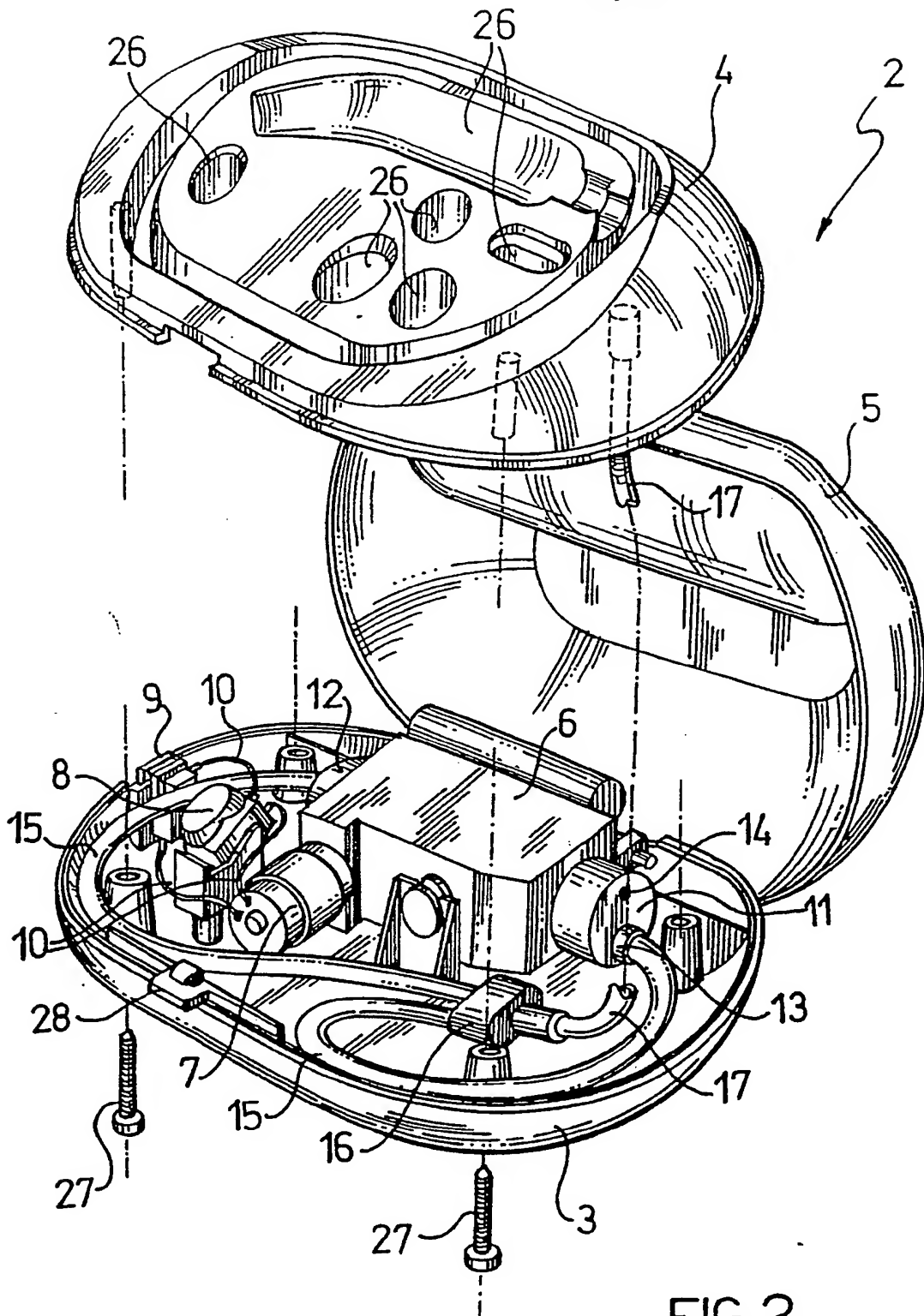


FIG.2

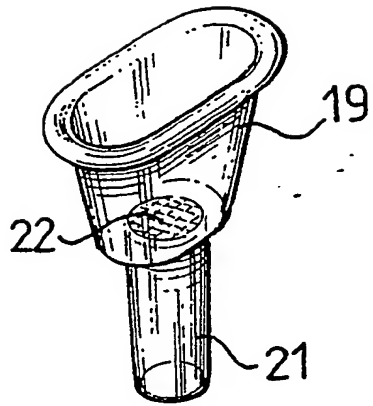


FIG. 3

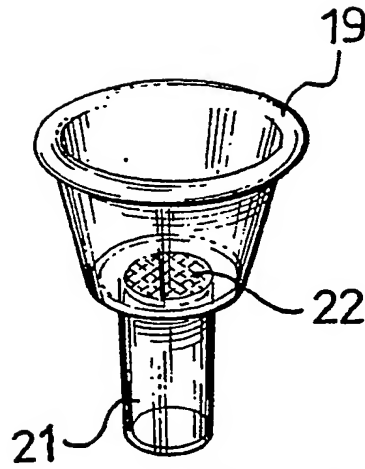


FIG. 4

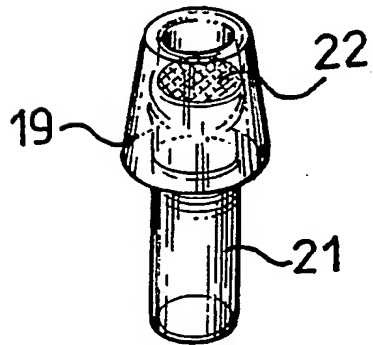


FIG. 5

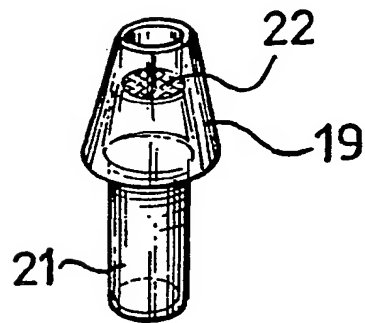


FIG. 6

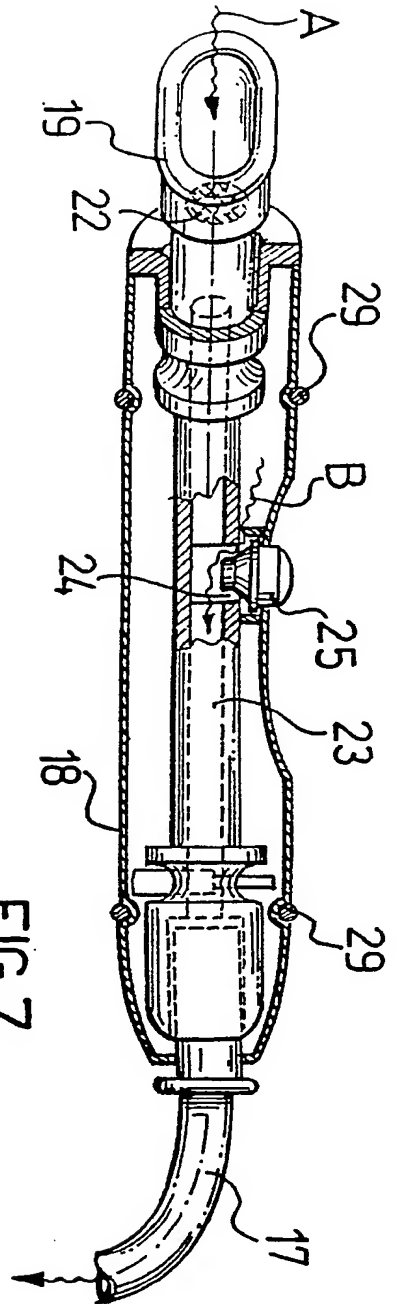


FIG. 7

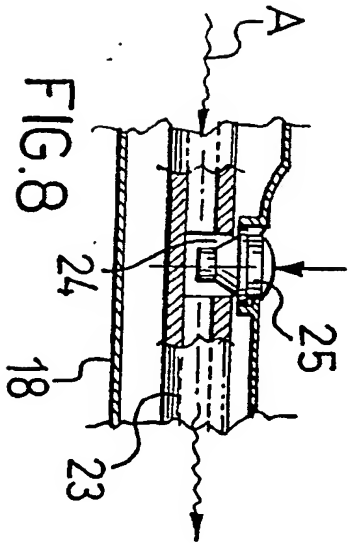


FIG. 8

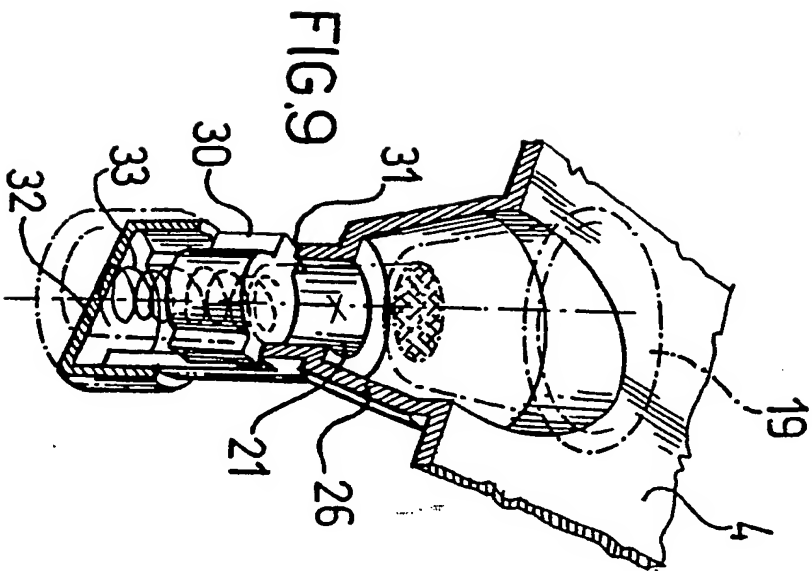


FIG. 9

Title: Portable vacuum device for home use for natural skin treatment, in particular of wrinkles

DESCRIPTION

Field of application

- 5 The present invention relates to a portable vacuum device for home use for natural skin treatment.

Specifically the present invention relates to a multifunctional portable device for home use which operates in accordance with a suction technique for
10 cleaning of the skin and beauty treatment of wrinkles.

The field of application of the present invention concerns the development of a small device suitable for home use and capable of achieving in a natural manner procedures and techniques of beauty treatment generally
15 achievable with the aid of chemical products (basically solvents) or processes of the electromagnetic stimulation type.

Known art

20 The beauty treatments for regeneration, detoxification, invigorating and cleaning of the skin, in particular of the face, have taken on ever greater importance in aesthetic medicine.

For beauty treatment of the skin and in particular of facial wrinkles, the employment of creams and lotions is
25 known. These products exert a chemical action mainly based on the presence of solvents capable of aiding deep cleaning of the skin.

The use of these products is at the same time tolerated with difficulty and particularly in allergic subjects.

Sometimes with extended treatments it is even possible to achieve the opposite effect, substantially of intoxication of the skin.

There are also known electromagnetic treatments performed
5 with special professional equipment.

Summary of the invention

The problem underlying the present invention is to provide a portable device for home use having structural features permitting natural treatment of the skin based
10 on the suction technique while overcoming the shortcomings which still limit the known art.

Said problem is solved by a portable vacuum device for home use for natural skin treatment characterised in that it comprises a container, a suction pump housed in said
15 container, a handle with suction head for skin treatment, and a flexible tube for connection of said suction pump with said handle.

Thanks to the device in accordance with the present invention which operates by means of a lifting action of
20 the skin, the patient or user is able to perform alone daily and in the most convenient surroundings, simply, economically and naturally, a beauty treatment of the skin and in particular of facial wrinkles.

The above described device stimulates in a natural manner
25 blood circulation and hyperoxygenation of the skin and hence aids revascularization of the cells which is essential for correct and lasting regeneration of the skin and, especially, for wrinkle treatment.

The device is particularly effective also for cleaning of
30 the face because as it aids in an absolutely natural manner and without recourse to chemical products

dilatation of the pores, it considerably facilitates skin cleaning.

It has been observed that this vacuum device can be used advantageously also for treatment of the scalp,
5 strengthening it and aiding hair growth.

Advantageously the handle with suction head comprises a suction regulator which permits the user during treatment easy and convenient control of suction intensity.

The suction regulator permits passing from a state of
10 non-suction or weak suction (inactive phase) to a state of intense suction (beauty treatment phase) and vice versa.

The user can thus operate in full freedom without the help of third persons and with no need for pre-setting or
15 preadjusting the device.

Preferably the suction regulator comprises a suction chamber arranged inside said handle and communicating with the suction head and with the connecting flexible tube, a breather hole in said suction chamber, and a
20 shutter which can be positioned in relation to said breather hole.

In this manner it is possible to adjust the suction intensity directly and with a high degree of accuracy. The device is active when the shutter is pressed against
25 the breather hole, closing it. When the shutter is released, opening the breather hole, suction intensity is annulled or greatly reduced so that the device runs in the inactive phase.

The suction pump of the device in accordance with the
30 present invention is advantageously of the double-action type comprising a pumping cylinder closed at both ends by

two end-of-travel heads, a piston arranged in said pumping cylinder which divides it in a sealed manner in two pumping chambers with each end-of-travel head being provided with a suction mouth and a delivery mouth with
5 associated valves permitting inlet and outlet respectively of the air to and from the pumping cylinder and said sucking device comprising a connecting element for connection of the suction mouths of the two end-of-travel heads with said flexible tube.

10 A pump of this kind, in addition to being versatile, is at the same time reliable and occupies little space and is therefore suitable for employment in the portable device for home use in accordance with the present invention.

15 The connecting element between the suction pump and the flexible tube comprises preferably a pair of tubes connected at one of their ends to the suction mouths, and a junction chamber connected to the other ends of said pair of tubes and to said flexible tube in such a manner
20 as to prevent undesired pressure loss.

Advantageously the vacuum device comprises a low voltage electric motor in said container for operation of the suction pump.

In this manner the low voltage electric motor in
25 accordance with the present invention, in addition to ensuring minimal energy consumption, permits low power suction suitable for skin treatment and in particular of the face, and meets the requirements for an electrical device for home use.

30 Again advantageously the suction head of said handle is interchangeable so that to the handle can be applied suction heads of different form and suction area. In this

manner the type of beauty treatment can be changed depending on the skin area it is intended to treat.

Preferably the suction head and the flexible connecting tube are provided internally with a micrograte to permit
5 retention of possible impurities sucked in by the pump and thereby prevent the latter from damaging or reducing the efficiency of the suction pump.

In this specific case, by micrograte is meant a grate having a mesh not greater than 2000 μm and in particular
10 not greater than 1000 μm .

Advantageously the vacuum device comprises a power regulator for the suction pump housed in said container as another instrument for control and regulation of the skin treatment by suction.

15 In a particular and advantageous embodiment of the device in accordance with the present invention the container comprises a first lower base shell, a second upper cover shell for the lower shell, and a closing cover for the upper shell, in said shell there being made a plurality
20 of housing seats designed for housing when not operating the handle, the flexible connecting tube and one or more suction heads.

The container thus provided has the dual characteristic of housing and protection of all the parts making up the
25 device which is the object of the present invention. Indeed, in a state of non-operation with the cover closed there is achieved a compact device of minimal space occupied, easy to transport, and capable of protecting hygienically the various component parts of the device
30 from external agents and blows.

Preferably said housing seats for the suction heads have

an elastically yielding bottom permitting easier grasping of the suction heads by the user and, in non-operating state with closed cover, improving of the steadiness thereof in the housing seats.

- 5 The characteristics and advantages of the method in accordance with the present invention are set forth in the description of an embodiment thereof given below by way of non-limiting example with reference to the annexed drawings.

10 Brief description of the drawings

In the drawings:

- figure 1 shows a perspective view of a vacuum device in accordance with the present invention;
- figure 2 shows a perspective view of the vacuum device
15 of FIGURE 1 in separate parts;
- figures 3 to 6 show a perspective view of different vacuum heads for the vacuum device of figure 1;
- figure 7 shows a cross section of the handle of the vacuum device of figure 1;
- 20 - figure 8 shows a cross section of a detail of the handle of figure 7 in a different operating condition; and
- figure 9 shows a cross section of a housing seat for the vacuum device head of FIGURE 1.

25 Detailed description of a preferred embodiment

With reference to figures 1 and 2, reference number 1 indicates as a whole and schematically a vacuum device provided in accordance with the present invention. Said

vacuum device 1 includes a container 2 comprising a lower
base shell 3 and an upper cover shell 4 superimposed
mutually and solidarized. For closing and protection of
the upper cover shell 4 there is also provided a cover 5
5 integral with the lower base shell 3.

In the lower base shell 3 is housed a suction pump 6
operated by an electric motor 7 preferably with low
voltage. Reference numbers 8, 9 and 10 indicate an on/off
switch for the electric motor 7, an electrical connector
10 and the electric connecting wires between the connector 9
and the electric motor 7 respectively.

The suction pump 6 is the double-action type comprising a
pumping cylinder (not shown) closed at its ends by two
end-of-travel heads 11 and 12. Inside the pumping
15 cylinder is arranged a piston (also not shown) which
divides in a sealed manner the latter in two pumping
chambers.

Each end-of-travel head 11 and 12 is provided with a
suction mouth 13 and a delivery mouth 14 with associated
20 valves (not shown) which permit inlet and outlet
respectively of the air from said pumping cylinder.

A connecting element represented in figure 2 by a pair of
tubes 15 and a connecting chamber 16 connects the suction
mouths 13 of the suction pump 6 to a flexible tube 17
25 termed "connecting".

The flexible tube 17 has the function of connecting
between the suction pump 6 and a handle 18 equipped with
an interchangeable suction head 19 for skin treatment.

The length of the flexible connecting tube 17 which must
30 be such as to permit convenient contact of the
interchangeable suction head 19 with the skin area it is

intended to treat can be freely varied by adding optional extensions.

The flexible connecting tube 17 and the suction head 19 are interchangeably inserted in a sealed manner in the
5 handle 18 by means of the ends 20 and 21.

The end 20 of the flexible connecting tube 17 is preferably reinforced by a rigid sleeve to permit a firmer coupling between the flexible connecting 17 and the handle 18.

10 The suction head can have a different form and suction surface depending on the type of beauty treatment it is desired to carry out and the skin area it is intended to treat. In figure 1 and in a more detailed manner in
15 figures 3 to 6 are shown by way of example four different interchangeable suction heads 19. In this particular case the interchangeable suction heads 19 are provided of transparent plastic material.

The suction heads 19 shown in figures 3 and 4 are suited for treatment of extended skin surface areas. In
20 particular the head of figure 3 is designed e.g. for treatment of the neck or cheeks while the head of figure 4 is more adapted to treatment of the forehead or scalp.

The suction heads 19 shown in figures 5 and 6 are better adapted to localised skin massage in small and/or
25 particularly delicate areas of the face, e.g. in the mouth and nose area or around the eyes. The form of these heads permits effective suction even in difficult points of the face.

In particular the head of figure 6 is suited for beauty
30 treatment in the more delicate and sensitive areas of the region around the eyes.

Preferably, the suction heads 19 (just as the flexible connecting tube 17) are provided inside with a micrograte 22 having a mesh e.g. of 750 μ m so as to retain any impurities sucked in by the suction pump 6 without damage or reduced efficiency of said pump.

In a preferred embodiment of the device in accordance with the present invention the handle 18 is equipped with a suction regulator for control of suction which is described below with reference to figures 7 and 8.

Reference number 23 indicates generally a suction chamber arranged inside the handle 18 and communicating with the suction head 19 and with the flexible connecting tube 17. Reference number 24 indicates a breather hole in said chamber 23 while 25 indicates a shutter with position adjustable in relation to said breather hole 24.

The chamber 23 is preferably made from a single body of elastomer material comprising also ducts for air passage at the ends of which are provided reinforcements designed to ensure optimal seal with the ends 20 and 21.

Advantageously the shutter 25 projects partially from the handle 18 to permit easy operation of the suction regulator by the user. By pressing the shutter 25 the breather hole 24 is closed as shown in figure 8.

In operating condition, with the double-action suction pump 6 operating and with the shutter 25 raised, there is created an air flow from the suction head 19 (arrow A) and from the breather hole 24 (arrow B) towards the flexible connecting tube 17.

By resting the suction head 19 against the skin for the beauty treatment and thus stopping the air flow indicated by the arrow A, there is obtained only a minimal (or

null) suction of the skin, because of the air flow coming from the breather hole 24.

By using the suction regulator, i.e. pressing the shutter 25 to close the breather hole 24, the suction power is transferred entirely onto the suction head 19 which thus
5 sucks the skin while raising it locally.

The movements of the suction head on the skin just as the use of the regulator depend mainly on the particular skin area which it is desired to treat and the type of beauty
10 treatment it is intended to carry out.

With reference to figures 1 and 2 the upper cover shell 4 is especially shaped in such a manner as to comprise seats 26 designed to house the flexible connecting tube 17, the handle 18, and the four suction heads 19.

15 The lower base shell 3 and the upper cover shell 4 are fastened together by means of screws 27 while the cover 5 is closed in relation to the upper cover shell 4 by means of an elastic hooking device generally indicated by 28 and arranged in the lower base shell 3.

20 The handle 18 is in turn made up of two half-shells closed in a mortised manner together. To better ensure adherence between the two half-shells there are provided outside the handle 18 elastic locking rings 29.

Preferably the housing seats 26 for the suction heads 19
25 have an elastically yielding bottom 30 as shown in figure 9. The elastically yielding bottom 30 is locked above inside the housing seat 26 by a stop wing 31 and below by a fixed bottom 32 integral with the housing seat 26. A spring 33 is arranged between the fixed bottom 32 and the
30 elastically yielding bottom 30 forcing the latter against the stop wing 31.

With the suction head 19 housed in the housing seat 26 of the upper cover shell 4 the head end 21 rests on the elastically yielding bottom 30 which is in turn supported elastically by the spring 33. By doing so the suction
5 head 19 does not penetrate completely in the housing seat 26 but permits easy recovery thereof by the user.

In addition, when not in use and with the closing cover 5 closed the spring 33 tends to push against the cover the suction head 19 which is thus more steadily housed in the
10 housing seat 26.

In another embodiment of the present invention, but not shown, there is provided insertion in the container 2 of a power control for the double-action suction pump 6 permitting changing the suction intensity depending on
15 the type of treatment to be performed.

Among the main advantages achieved by the device in accordance with the present invention it is important to note the fact that for the first time there is provided for beauty treatment of the skin a multifunctional and
20 portable device for home use operating by natural processes, simple, reliable, and not needing any particular maintenance.

CLAIMS

1. Portable suction device for home use for natural skin treatment characterised in that it comprises a container (2), a double-action suction pump (6) housed in said container (2), a handle (18) with suction head (19) for skin treatment, and a flexible connecting tube (17) for connection between said double-action suction pump (6) and said handle (18).
2. Device in accordance with claim 1 characterised in that said handle (18) comprises a suction regulator for control of the skin treatment.
3. Device in accordance with claim 2 characterised in that said suction regulator comprises a suction chamber (23) arranged inside said handle (18) and communicating with the suction head (19) and with the flexible connecting tube (17), a breather hole (24) in said suction chamber (23), and a shutter (25) adjustably positionable in relation to said breather hole (24).
4. Device in accordance with claim 1 characterised in that said suction pump (6) is the double-action type comprising a pumping cylinder closed at its ends by two end-of-travel heads (11,12), a piston arranged inside said pumping cylinder dividing in a sealed manner the latter in two pumping chambers and each end-of-travel head (11,12) being provided with a suction mouth (13) and a delivery mouth (14) with associated valves allowing inlet and outlet respectively of the air to and from said pumping cylinder, said sucking device comprising a connecting element for connection of the suction mouths (13) of the two end-of-travel heads (11,12) with said flexible tube (17).
5. Device in accordance with claim 4 characterised in

that said connecting element comprises a pair of tubes (15) connected at one end to the suction mouths (13), and a connecting chamber (16) connected to the other ends of said pair of tubes (15) and to said flexible tube (17).

5 6. Device in accordance with claim 1 characterised in that it comprises a low voltage electric motor (7) housed in said container (2) for operation of the double-action suction pump (6).

10 7. Device in accordance with claim 1 characterised in that said suction head (19) is interchangeable.

8. Device in accordance with claim 1 characterised in that said suction head (19) has a micrograte (22) for retention of possible impurities.

15 9. Device in accordance with claim 1 characterised in that said flexible tube (17) is provided internally with a micrograte for retention of possible impurities.

10. Device in accordance with claim 1 characterised in that it comprises a power regulator for the suction pump housed in said container (2).

20 11. Device in accordance with claim 1 characterised in that said container (2) comprises a first lower base shell (3), a second upper cover shell (4) for the lower base shell (3) and a closing cover (5) for the upper cover shell (4), and there being made a plurality of
25 housing seats (26) designed to house when the device is not running the handle (18), the flexible tube 17 and one or more suction heads (19).

12. Device in accordance with claim 11 characterised in that said housing seats (26) have an elastically yielding
30 bottom (30).

Patents Act 1977 Examiner's report to the Comptroller under Section 17 (The Search report)		Application number GB 9414248.6
Relevant Technical Fields (i) UK Cl (Ed.M) A4V (V29A) A5R (REQ) (ii) Int Cl (Ed.5) A45D 44/22 A61H 7/00		Search Examiner R E Hardy
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii) WPI		Date of completion of Search 17 October 1994 Documents considered relevant following a search in respect of Claims :- All

Categories of documents

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Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.	E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A: Document indicating technological background and/or state of the art.	&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2120944 A	(TORIT) see the figures	Claim 1 at least
X	GB 2092003 A	(LAI) page 1 lines 90-112 and page 2 lines 11-34	" "
X	GB 1492308 A	(WU) see Figure 5 and page 3 line 1 onwards	" "
X	GB 0788394 A	(FLETCHER) see the figures	" "
X	GB 0404200 A	(ITTING) see the figures	" "
X	GB 0306208 A	(STANLEY) see the figures	" "
X	GB 0349679 A	(LIDDIARD) see the figures	" "
X	US 3906940 A	(KAWADA) see the figures, reference 38	" "
X	US 0032352 E	(WANG) see the figures	" "
X	EP 0365230 A2	(KEY TRADING) see the figures	" "

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